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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant : Rodney Thomas Fox et al. Art Unit : 1617
Serial No.: 09/720,942 Examiner : Shaojia A. Jiang
Filed : June 8, 2001
Title : TREATMENT OF AIRBORNE MICROORGANISMS

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

BRIEF OF APPELLANT

Transmitted herewith are Appellant's brief, in triplicate, a petition for a one-month extension of time and a check in the amount of $440 as required by 37 CFR §§ 1.17(a)(1) and (c). A Notice of Appeal in this case was mailed to the Patent and Trademark Office on 18 May 2004 and was received on 24 May 2004. Accordingly, the petition for extension of time extends the time to file this brief to 24 August 2004.

Any additional fees in connection with this brief should be charged to Deposit Account No. 06-1050.

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Maria A. Gillis
Typed or Printed Name of Person Signing Certificate

(1) Real Party in Interest

The real parties in interest are the joint assignees, University of Southampton, of Highfield, Southampton, England and Reckitt Benckiser (UK) Limited of Slough, Berkshire, England.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

Claims 1-16 are pending in this application. All of these pending claims are under appeal. A clean copy thereof is attached to this brief as an Appendix, as required under 37 CFR § 1.192(c)(9).

(4) Status of Amendments

No amendments under Rule 116 were filed.

(5) Summary of Invention

The invention involves disinfecting or sanitizing an indoor space occupied by airborne microorganisms, including viruses [page 3, line 8]. A disinfecting or sanitizing composition is introduced into a spray device and droplets of the composition are sprayed out into the space being disinfected or sanitized [page 3, line 10]. During the spraying operation, a unipolar charge is imparted to the liquid droplets of the composition by double layer charging, said unipolar charge being at a level such that the droplets have a charge to mass ratio of at least $\pm$ 1 x 10^{-4} C/Kg [page 3, line 12]. All of the droplets carry the same polarity charge, and thus are repelled from one another. Accordingly, there is little or no coalescence of the droplets and they tend to spread out to a greater extent than uncharged droplets [page 5, line 24]. Additionally, the charged droplets are attracted to

the microorganisms which, in effect, means that the microorganisms are targeted by the liquid droplets [page 6, lines 4-14]. The charged particles target microorganisms that are attached to dust particles [page 6, line 4] and also microorganisms present in dust-free spaces [Example 2].

The charge is imparted to the particles as a result of employing an aerosol spray device whose features are chosen to achieve, by double layered charging, the appropriate unipolar charge to the droplets. These features include: the material of the actuator; the size and shape of the orifice of the actuator; the diameter of the dip tube; the characteristics of the valve; and the formulation of the disinfecting or sanitizing composition contained within the aerosol spray device [page 8, line 7 -- page 9, line 17]. No charge is imparted to the spray device by means of any internal or external charge inducing system [page 4, lines 8-21].

(6) Issues

There are two issues in this appeal.

All of the claims have been rejected under the first paragraph of 35 USC § 112 on the ground that an amendment filed on 23 August 2003 introduced new matter into claim 1, from which all of the claims in this application depend. Applicants will show, in this brief, that the amendatory material did not present new matter.

All the claims had been rejected under 35 USC § 103(a) as unpatentable over PCT Publication WO 97/288,883 ("Fox") in view of McCue U.S. Patent No. 5,403,587 ("McCue"). Applicants contend that their claims would not have been obvious over these references.

(7) Grouping of Claims

For purposes of this appeal, all of the claims stand or fall together.

(8) Argument

Rejection under 35 USC § 112, first paragraph

In an amendment filed on 5 January 2002 (mailed on 5 December 2001), Applicants amended claim 1 to read:

> A method of disinfecting or sanitizing a space occupied by airborne microorganisms and/or viruses, which method comprises directing into the space liquid droplets from a spray device containing a disinfecting or sanitizing composition, a unipolar charge being imparted to the liquid droplets by double layer charging during the spraying of the liquid droplets from the spray device, the unipolar charge being at a level such that said droplets have a charge to mass ratio of at least + 1 x 10-4 C/kg.

This claim did not give rise to any new matter problems. In an amendment filed on 23 August 2003, claim 1 was further amended in the following manner:

> A method of disinfecting or sanitizing a space occupied by airborne microorganisms and/or viruses, which method comprises directing into the space liquid droplets from a spray device containing a disinfecting or sanitizing composition, a unipolar charge being imparted to the liquid droplets by double layer charging during the spraying of the liquid droplets from the spray device, the unipolar charge being at a level such that said droplets have a charge to mass ratio of at least $\pm$ 1 x 10^{-4} C/Kg, wherein the liquid droplets, being mutually repelled from one another, spread out to a greater extent than similar particles in an uncharged state and thereby kill the airborne microorganisms and viruses that are not attached to dust particles.

All of the claims in this application depend directly or indirectly from claim 1 and have been rejected by the Examiner on the ground that the phrase "not attached to dust particles" is new matter not supported in the original specification, thus causing the claim to fail to meet the requirements of 35 USC § 112, first paragraph.

In support of the rejection, the Examiner says that "any negative limitation or exclusionary proviso must have basis in the original disclosure", citing Ex parte Grasselli, 231 U.S.P.Q. 393 (Bd. App. 1983). Any amendment to claims must find support in the original disclosure but the Examiner appears to be advancing the proposition that, where a negative limitation is asserted into a claim, there is some special rule. The Grasselli decision nearly stated that, under the facts of that particular case, a claim reciting that a catalyst is "free of uranium and the combination of vanadium and phosphorus" did not

appear in the specification as filed and introduced new concepts that violate the description requirement of the first paragraph of 35 USC § 112. The Grasselli case cannot support a contention that there is a special rule governing amendments that introduce negative limitations.

In determining whether subject matter inserted into an amended claim may violate the new matter prohibition, one looks at whether the concept embodied in the phrase is disclosed in the specification, not whether the exact words appear in the specification. The Board in the Grasselli decision cited in re Anderson, 471 F.2d 1237, 176 U.S.P.Q. 331 (C.C.P.A. 1973). This decision is one of many that summarize the law as regards new matter:

> The question, as we view it, is not whether "carrying" was a word used in the specification as filed but whether there is support in the specification for employment of the term in a claim; is the concept of carrying present in the original disclosure? We think it is. We think disclosure of the primary layer as a "vehicle" for the medication is quite sufficient for this purpose.

176 U.S.P.Q. at 336. In the instant application, the question is whether the concept of killing airborne microorganisms that are not attached to dust particles is disclosed in the specification.

Support for the amended language of Applicants' claim 1 is found in various places in the specification. In addition to the general language on pages 5 and 6 of the specification, specific support is found in Examples 1 and 2. The test microorganism, micrococcus lutens, was tested in a chamber provided with HEPA filtered air. HEPA filtered air effectively removes all particles down to 0.3 microns in size. The abbreviation HEPA refers to "high efficiency particulate air" filters. Attached to the Amendment under 37 CFR § 1.111 filed on 23 August 2003 (as exhibit A) was a copy of a web page from SAS Air Purifiers, a manufacturer of such filters that are sold under the trademark SENTRY. The chart shows that HEPA filters effectively remove "lung damaging dust" from ambient air. An HEPA filter that removes dust particles greater

than 0.3 microns will effectively create a dust-free atmosphere. Ancillary indirect support for the fact that Applicants' Examples 1 and 2 are done in a dust-free atmosphere can be found in the Fox reference on page 9, lines 4-35, where there is a discussion of treating dust particles with a charged aerosol substance and it is mentioned that the dust particles actually tested range between 2 and 5 microns. HEPA filters are not used in the test reported in the Fox reference. However, when HEPA filters are used – as in the examples in the instant application – they create an essentially dust-free environment.

In the final rejection mailed on 19 November 2003, the Examiner addresses this matter and observes that Applicants have not shown that employing an HEPA filter provides "an absolutely dust-free atmosphere". This is literally true but, for all practical purposes, filtering out particles greater than 0.3 microns does create a dust-free atmosphere. It must be borne in mind that we are not seeking to create a "clean room" of the type required for the manufacture of computer chips. Rather, we are dealing with ordinary indoor, industrial, institutional or domestic living spaces -- as more particularly pointed out in the specification at page 2, line 8, and page 4, line 20. For these purposes, removal of particles greater than 0.3 microns constitutes a dust-free environment.

Rejection under 35 USC § 103(a)

All of the claims have been finally rejected as obvious over Fox in view of McCue. In response to an earlier rejection over the same references, Applicants amended claim 1, as discussed above, to require that the microorganisms killed by Applicants' claimed methods are microorganisms that are not attached to dust particles. This is in contrast to the disclosure of the Fox reference which teaches that microorganisms associated with dust particles are precipitated, along with the dust particles.

Examples 1 and 2 of the instant application show clearly that the use of Applicants' methods enables the user to effectively control airborne microorganisms that are not attached to dust particles. The practical effect of Applicants' claimed invention is greater efficiency in controlling microorganisms in indoor spaces because Applicants are

providing a method of control for those microorganisms that are not attached to dust particles, as well as for those that are attached to dust particles.

The Fox reference involves precipitation of airborne dust particles. In contrast, Applicants' claimed invention is directed to a method for combating microorganisms in which the microorganisms are deactivated by a disinfecting and sanitizing composition while the composition is airborne. Precipitation is not part of Applicants' claimed methods. Of course, if microorganisms are attached to the airborne dust particles (as in the Fox reference) they will be precipitated by the disinfecting or sanitizing composition used in Applicants' claimed methods. This is essentially acknowledged by Applicants in the paragraph beginning at page 6, line 4, of their specification. However, not all microorganisms are associated with dust particles and it is against these microorganisms that Applicants' claimed methods are directed. These methods are not taught in the Fox reference and would not have been obvious over anything taught by Fox.

In the final rejection mailed on 19 November 2003, the Examiner asserts that "the critical method steps, employing the same function device and spraying into a space, have been taught by Fox". The Examiner goes on to assert that Applicants have merely discovered some latent properties in the methods disclosed in the Fox reference. What the Examiner fails to recognize, however, is that one of the features of the Fox disclosure is that dust particles bearing microorganisms are precipitated. There is no precipitation in Applicants claimed methods as set forth in the specification at page 5, line 18, through page 6, line 3:

> As a result of the method of the present invention, airborne microorganisms and/or viruses can be eliminated with considerable efficiency as compared to known spraying methods. In particular, much less disinfectant or sanitizing agent is required than has previously been the case.
>
> This result is achieved because of the unipolar charge imparted to the liquid droplets of the aerosol spray. This charge has two effects. The individual droplets are attracted to the microorganisms and/or viruses, including microorganisms attached to dust particles. Since all of the droplets carry the same polarity charge, they are repelled one from another. Accordingly, there is little or no coalescence of the droplets and, in contract, they tend to spread out to

> a great extent as compared to uncharged droplets. In addition, if the repulsive forces from the charge within the droplets is greater than the surface tension force of the droplets, the charged droplets are caused to fragment into a plurality of smaller charged droplets (exceeding the Rayleigh limit). This process continues until either the two opposing forces are equalized or the droplet has fully evaporated.

Precipitation is an important feature of the method taught by Fox and cannot be ignored when considering the question of whether Applicants claimed methods would have been obvious.

To support her rejection of Applicants' claims, the Examiner has turned to the McCue patent. McCue was used originally for its disclosure of antimicrobial compositions containing essential oils having antimicrobial properties, and also for its disclosure of dispensing systems – column 5, lines 44-64 – which would include pump sprays and aerosols. Applicants previously pointed out that the McCue compositions are specifically intended to be used on hard surfaces and that there is no teaching anywhere in McCue that the compositions may be sprayed into an indoor space. In the final rejection, the Examiner is limiting the use of McCue to simply show that the disinfecting hand sanitizing compositions of McCue are known to have antimicrobial activity. Applicants do not disagree with this assertion but wish to point out that the particular disinfecting and sanitizing compositions used in Applicants claimed methods are not the asserted basis for patentability.

CONCLUSION

In view of the foregoing arguments, it is urged that this Board overrule the Examiner's rejection of claims 1-16.

Respectfully submitted,

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Appendix - Claims on Appeal

1. A method of disinfecting or sanitizing a space occupied by airborne microorganisms and/or viruses, which method comprises directing into the space liquid droplets from a spray device containing a disinfecting or sanitizing composition, a unipolar charge being imparted to the liquid droplets by double layer charging during the spraying of the liquid droplets from the spray device, the unipolar charge being at a level such that said droplets have a charge to mass ratio of at least $\pm$ 1 x 10^{-4} C/Kg, wherein the liquid droplets, being mutually repelled from one another, spread out to a greater extent than similar particles in an uncharged state and thereby kill the airborne microorganisms and viruses that are not attached to dust particles.

2. A method as claimed in claim 1 wherein the spray device is an aerosol spray device.

3. A method as claimed in claim 2 wherein the disinfecting or sanitizing composition is an emulsion.

4. A method as claimed in claim 3 wherein the liquid droplets have a diameter in the range of from 5 to 100 micrometres.

5. A method as claimed in claim 4 wherein the unipolar charge is imparted to the liquid droplets solely by the interaction between the liquid and the spray device, without any charge being imparted thereto from an internal or external charge inducing device.

6. A method as claimed in claim 5 wherein the required droplet charge to mass ratio is imparted to the droplets as a result of the use of an aerosol spray device with at least one of the features of:

(a) the material of the actuator,

(b) the size and shape of the orifice of the actuator,

(c) the diameter of the dip tube,

(d) the characteristics of the valve, and

(e) the formulation of the disinfecting or sanitizing composition contained within the aerosol spray device

being chosen in order to achieve said droplet charge to mass ratio by double layer charging imparting the unipolar charge to the droplets during the actual spraying of the liquid droplets from the orifice of the aerosol spray device.

7. A method as claimed in claim 6 wherein the disinfecting or sanitizing composition comprises: an oil phase; and aqueous phase; a surfactant; an anti-bacterial agent, a fungicide or an anti-viral agent; and a propellant.

8. A method as claimed in claim 7 in which the composition comprises, as an anti-bacterial or anti-viral agent, an essential oil selected from the group consisting of thyme, lemon grass, lemon, orange, grapefruit, yeast, oregano, anise, clove, cinnamaldehyde, cinnamon, carvacrol, rose, lavender, citronella, eucalyptus, peppermint, camphor, sandalwood, juniper berry, Siberian pine needle, pine sylvester, tea tree, litsea, rosewood, patchouli, vetyver, cedarwood and mixtures thereof.

9. A method as claimed in claim 7 which comprises a quaternary ammonium compound as an anti-bacterial agent.

10. A method as claimed in claim 7 wherein the oil phase includes a C_9-C_{12} hydrocarbon.

11. A method as claimed in claim 10 wherein the C_9-C_{12} hydrocarbon is present in the composition in an amount of from 2 to 10% w/w.

12. A method as claimed in claim 7 wherein the surfactant is glyceryl oleate or a polyglycerol oleate.

13. A method as claimed in claim 12 wherein the surfactant is present in the composition in an amount of from 0.1 to 1.0% w/w.

14. A method as claimed in claim 7 wherein the propellant is liquefied petroleum gas.

15. A method as claimed in claim 14 wherein the propellant is present in the composition in an amount of from 20 to 50% w/w.

16. A method as claimed in claim 1 wherein the space to be disinfected or sanitized contains micrococcus lutens bacteria.